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PART I - THE CUBAN SHARK INDUSTRY

PART II - CUBAN GOVERNMENT FOSTERS FISHING COOPERATIVES

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THE CUBAN SHARK INDUSTRY[1/]

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Summary: For many years Cuban fishermen have caught large numbers of sharks and exported shark products, particularly to the United States and Germany. Until recent years, however, the industry operated in a haphazard manner. The skin frequently was the only product retained while at other times only the liver or the fins were used. More recently, shark liver oil has been shipped to the United States while most of the meat has been used in Cuba.

Cuba now has three complete processing plants, about 20 smaller dependent ones, and about 20 collecting stations. In addition, there are two oil-rendering plants and a third one will soon be constructed. A new shark-skin tannery began commercial production in 1946.

1/ This report (No. 155) supplements report No. 372, Sept. 20, 1946, "The Cuban Fishing Industry," prepared in response to a questionnaire (unnumbered instruction of April 22, 1946) submitted by the Bureau of Foreign and Domestic Commerce, incorporating the requirements of the Department of Agriculture, the Fish and Wildlife Service and the Tariff Commission.

* Clerk-Translator, American Embassy, Habana, Cuba (April 17, 1947).

The annual output of the shark industry during the 5 year period 1942-1946 averaged 11,000 skins of which 6,000 were tanned, 18,000 pounds of dry fins, about 500,000 pounds of salted meat, some 164,000 pounds of liver in brine, and 61,000 pounds of liver oil. Except for all the meat, some fins and a little refined oil, all of these products were exported. Exports in 1946 were valued at $133,000, nearly 8 times the average of 1937-41.

Production: Shark-fishing on a commercial scale in Cuba centers around the ports listed below. Cojimar, near Habana (Figure 1), to which much of the catch converges, is the most important, followed by Bahia Honda and Puerto Esperanza in Pinar del Rio Province. These three ports supply roughly half of the total catch. There are "collecting" stations at the ports marked (1) and "processing" stations at those marked (2). The difference between the former and the latter is explained under "Processing."

Province	Port
Habana	Cojimar (2)
	Boca de Jaruco (2)
	Santa Cruz del Norte (2)
	Nueva Gerona (2), Isle of Pines
Oriente	Santiago de Cuba (1)
	Guantanamo (1)
	Caimanera (1)
	Manzanillo (1)
	Baracoa (1)
	Antilla, Nipe Bay (1)
Pinar del Rio	Bahia Honda (2)
	Puerto Esperanza (2)
	Cabanas (1)
	Mariel (2)
	Arroyos de Mantua (1)
	Morrillo (1)
Matanzas	Mantanzas (1)
	Cardenas (1)
Las Villas	Isabela de Sagua (2)
	Caibarien (2)
Camaguey	Moron (2)
	Gloria (2)

At least 30 different kinds of sharks are caught off Cuban shores. The names of those that have been identified are given in Table 1. The industry relies heavily on the Night shark (Tiburon de Noche), which constitutes roughly 60 to 75 percent of the total catch (Figure 2). Other varieties caught in sizeable quantities include the Man-eating shark (jaqueton), the Black-tipped shark (galano) and the Nurse shark (gata), which together comprise roughly 15 to 25 percent of the total catch. The male Hammerhead (cornuda), reputedly having an exceptionally large oil content, is scarce, difficult to land, and accounts for only about 5 percent of the catch.

Table 1 - Names of Sharks Caught Commercially by Cuban Fishermen[1/]

Common Name	Local Name	Scientific Name
Night shark	Tiburon de noche	Hypoprion signatus
[2/]	Tiburon comun	Carcharias comersonii
[2/]	Tiburon	Carcharias remotus
Great white	Tiburon Jaqueton	Carcharadon carch.
Black-tipped	Tiburon galano	Carcharias limbatus
[2/]	Tiburon dientuzo	Isurus tigris
Nurse shark	Gata (means cat)	Ginglymostoma cirrat
Hammerhead	Cornuda	Platysqualus tudes
Tiger	Alecrin	Galeocerdo articus
Surgeon shark	Tiburon de ley	Carcharias aeronotus
Jakie	Cabeza de batea	Squatina squatina
Cub shark	" " "	Carcharias platyodon
Sharp-nosed	Cazon de playa	Scoliodon ter.-novae
Oblique-toothed	" " "	Eulamia falciformis
Common Hammerhead	Cornuda-Cruz	Sphyrna zygaona
Sawfish	Pez Sierra	Pristis pectinatus
Smooth dogfish	Tiburon Boca Dulce	Mustelus canis
Six-gilled	Tiburon Cana-bota	Hexanchus griseus
Spiny dogfish	Galludo	Squalus cubensis
Common Thresher, Fox	Tiburon Zorra	Alopias vulpinus
Mako	Tiburon Marrojo	Isurus oxyrhincus
Small black-tipped	Tiburon pinta roja	Eulamia limbatus
Brown shark	Tiburon Sierra	Eulamia milberti
Bull shark	Tintorera	Eulamia leucas
Sand tiger	Tiburon de arena	Carcharias taurus
Great blue shark	Tiburon azul	Prionace glauca
[2/]	Tiburon	Hypoprion brevirost

1/ Bureau of Fisheries, Cuban Ministry of Agriculture; Cuban shark trade, and Fishes of Cuba and the Atlantic Coasts of Tropical America, by Carlos de la Torre y Huerta, no date, published by Museo Carlos de la Torre, Habana.

2/ Name not ascertained.

The Night shark reportedly is found abundantly in practically all of the fishing areas on the north coast of Cuba, and off Cape San Antonio on the western tip of the Island. None have been caught on the south coast, except at San Felipe Keys. Other sharks are likewise found abundantly on the north coast.

Although sharks are caught all year round, the main season extends from February, when the run of male Night shark begins, to July. Female Night sharks are more abundant in May and June; the peak of the season is consequently reached during these two months. A second run of male Night sharks occurs in September and October. During the runs the sharks remain at great depths in the daytime but rise to the surface at night for food.

There is no shark-fishing fleet as such, except for 5 small schooners equipped with winches, and one 60-foot 225 H. P. diesel-driven roving vessel.

This vessel has 3 set lines with 150 hooks for fishing at any depth, and processing equipment on board (Figure 4). One of the companies is anxious to sell its two 7-ton schooners because regulations require a skipper and machinist to be on board in addition to the crew, and because upkeep is too costly.

Most shark-fishing is done in 15- or 18-foot, heavy-duty row-boats with removable masts which are also used in catching other fish (Figure 3). The largest fishing company has 52 such boats, of which 16 are at Bahia Honda, 15 at Puerto Esperanza, 8 at Mariel, 8 at Morrillo, and 5 at Cojimar. Another large company owns 20 such boats of which 6 are at Cojimar, 4 at Santa Cruz, 4 at Mariel, and the rest are scattered at other ports. These companies rent the boats out to the fishermen for a nominal daily fee. An undetermined number of row-boats belong to the fishermen themselves, who also use them for other fishing. The companies and the fishermen feel that much time and labor would be saved if the row-boats could be equipped with 3-horse-power gasoline motors.

Sharks are caught by three different fishing methods: About 75 percent of the total catch is by the simple, hand line, 15 percent by the multiple-hook line (palangre) and perhaps 10 percent by nets.

The simple hand line is generally used in row-boats with removable masts. During the season fishermen go out every day except Sundays. Two men go on each boat, usually starting about midnight. They take five or six lines with wire leader and hook. For bait they use about a half pound of mullet (lisa), mangrove (caballerote), dolphin (dorado) or tarpon (sabalo), caught by the fishermen themselves or bought from others. They cast their lines from $1\frac{1}{2}$ to as much as 5 or 6 miles away from shore. They troll either by sailing or rowing depending on the wind, and move in the direction of the wind to prevent the line from sinking. In May and June when female Night sharks are more abundant they fish at 20, 30 or 50 fathoms; but from February to April fishing is more difficult because the Night sharks swim at greater depths, and are fished at 80 to 200 fathoms. The fishermen usually return at dawn, sometimes empty-handed, and sometimes with from one to seven sharks. In exceptional cases they may bring in nine sharks. The maximum number ever caught in one day by fishermen from Cojimar reportedly was 152, but 100 sharks is considered a good day's catch (Figure 5).

Multiple hook lines are employed regularly by two or three large vessels. These lines consist of a henequen rope (3/4 inches thick) to which are attached at 30-foot intervals several wire leaders. These leaders usually are 18 feet long and have hooks with $1\frac{1}{2}$ to 3 inch openings. The multiple hook line is employed mostly at 300 or 350 fathoms for fishing cow or six-gilled sharks.

The largest processors prefer to have their fishing fleets use the multiple hook at depths greater than 150 fathoms, and are anxious to learn about more modern equipment that would enable them to obtain commercial catches with less danger of damage to the lines and at a lower cost.

Nets are employed at Bahia Honda and Puerto Esperanza. They are usually made by local fishermen from No. 84 cotton twine in different size meshes, and as a rule are 12 feet deep. The largest shark fishing company has considered using during the shark run large nets such as those employed on the west coast of the United States but they doubt that at present the investment is warranted.

The quantity of sharks caught in 1946 is estimated at nearly 16,000, the same as in 1945 but about one-third more than was caught during the war years when the submarine menace rendered operations difficult. About 20 percent of the annual catch usually has been wasted, owing to improper handling of the by-products or to lack of adequate processing facilities.

Table 2 - Cuban Shark Catch and Production of Shark Products, Estimated Average 1937-41, Yearly 1942-1946, Inclusive.

Year	Quantity caught 1/	Skins 2/	Dry fins 4/	Meat, salted 5/	Livers in brine 7/	Liver oil 7/
	1,000 sharks	1,000 skins	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
Average 1937-41	12	10	15	100	37	8/
Annual						
1942	12	10	15	398	117	8/
1943	13	11	16	978 6/	190	49 9/
1944	14	12	17	600	176	140 9/
1945	16	12	20	476	152	82 9/
1946	16	11 3/	20	500	185	32 9/

1/ Estimated on the basis of skins exported after having added waste of 20 percent plus waste of 1,000 skins in 1945 and 2,000 in 1946.
2/ Estimated on the basis of exports of shark skins; converted from kilos to number of sharks at 8.6 pounds per skin.
3/ Includes about 6,000 tanned skins.
4/ Estimated at 1.25 pounds of dry fins per shark.
5/ As reported by producers to Bureau of Fisheries, Cuban Ministry of Agriculture, for 1942, 1943, and 1945; estimates for other years.
6/ Apparently erroneous; too high.
7/ Official foreign trade statistics.
8/ Less than 500 pounds.
9/ Crude oil except for an estimated 3,000 pounds refined.

Processing: There are three large processing plants at Cojimar and many so-called "collecting" and "processing" stations scattered all over Cuba. The "collecting" stations, of which there are about twenty, skin and salt the sharks and send the skins to Cojimar for curing and disposal. They also pack the livers in used brine drums furnished to them by the two oil-rendering plants at Habana and Cojimar (the only ones), which repack the livers or extract the oil. Most of them waste the meat and the few that do cure it ship the fillets to Cojimar to be packed in cartons.

"Processing" stations are known as "tendederos" which literally means "drying grounds." There are about twenty of these in Cuba. They handle the shark products more thoroughly than the collecting stations and have equipment for treating and curing the meat, fins, and skins. They also frequently boil the livers in rudimentary kettles for further processing by the oil-rendering plants. At some

ports, particularly Caibarien, the sharks reportedly are skinned on board the fishing vessel, the livers are deposited in brine barrels, and the carcasses are thrown overboard.

At the three large plants at Cojimar the sharks are usually weighed on arrival, skinned and fleshed at the beach. The only tools used are a small straight knife for skinning, a curved one for fleshing and a large butcher's knife for trimming the meat. A skillful man can skin and flesh a shark in 20 minutes whereas others require 30 to 40 minutes.

First, the fins and the liver are removed and placed in tin cans or pails in the sun. Then the tail is cut off and an opening is made along the shark's back, around the gills and the lower jaw. The skin is progressively stripped from the carcass down the sides and around the belly (Figure 6).

A layer of flesh is usually left on the skin and this is removed immediately by fleshing. While most fleshers do not use a beaming board, some stretch the skin on the board, trimming off the flesh. The skin is then washed at the beach in the ocean water.

Next the meat is dressed. The outer layer of red meat is removed and discarded. The white flesh is washed with salt water and carried into the packing plant. Workers of one large concern must carry the meat, liver, etc., about 150 yards to the packing plant on a hilltop (Figure 9).

The head, teeth, viscera and bones are discarded and dumped into the ocean two or three miles away from the shore. When questioned as to why no fish meal is prepared with the shark waste, one packer stated that he did not know how to make it; another said it was too costly; and a third advised that a large poultry farm is now interested in fish meal and that he is considering the installation of equipment to prepare it. An initial sample shipment of salted shark bellies is being prepared by the local tannery at the request of a firm in Boston.

At the plant the fins are not soaked as is customary in other countries, but are merely spread on wooden racks about two feet above the ground to dry in the sun for about ten days (Figure 10). Marketable fins usually consist of a set of two pectorals, one or two dorsals,and one tail fin. All other fins and the upper lobe of the tail are wasted. A set of fins weighs an average of about four pounds when fresh and about 1.25 pounds when dry. After drying the fins are packed in used bags containing 35 to 40 pounds gross weight.

The fleshed and trimmed skins are allowed to drain on poles within the plant for about 10 minutes, whereupon salt is spread on the fleshy side and they are laid with the fleshy side up on a board inclined slightly so that the brine will drip off. They are left to cure anywhere from 10 to 20 days, after which they are folded up and are packed in used bags containing from 200 to 300 pounds each, the average weight being around 250. About 70 percent of all the cured skins produced reportedly weighed 7 to 9 pounds each or an average of 8 pounds and the remaining 30 percent varied widely averaging 10 pounds each.

Since March 1943 a tannery at the village of Jaimanitas, just outside of the city of Habana, has been experimenting with vegetable tanning of shark skins. The tannery is located in a wooden shack. Its owner has gradually equipped it

with a 12 H. P. boiler, a gasoline motor, two drums, several vats for tanning, two shaving machines, one buffing machine, and one staking machine. The tannery reportedly spoiled hundreds of skins up to 1945 but in 1946 perfected a processing formula for preserving the raw skins, which prevents sour-spots and reduces spoilage. The tannery estimates its maximum capacity at 4,000 skins monthly.

Only 6,000 hides were tanned in 1946, however. The salted skins are first subjected to a liming process and immersed in the vats where they are left to tan for about 25 days. The shagreen is removed from the skins and the resulting hides are shaved off, fat-liquored, and stretched out on tacking-frames to dry in the sun. Once dry the hides are put through the staking machines to soften them, and through the buffing machine to buff the fleshy side. In March 1947 the tannery at Jaimanitas developed a process for tanning Nurse shark skins which until then were wasted because the corium of this particular species is different from the others and in tanning the hide stiffened like cardboard and cracked.

Tanned hides, on the average, weigh about one-fourth as much as the salted skins, or about 2 to 2.5 pounds each. The average size of the hides reportedly is 5 square feet, but varies from 1.5 to 15 square feet; 45 square feet being the largest known. They are packed in russet condition in wooden boxes with 400 pounds net each.

Except for the Thresher shark (zorra) which is considered inedible, the meat of all other sharks is processed for human consumption. The fresh meat is washed and cut into fillets which are then dipped into a brine solution and left to cure for one, two or three days. They are thereafter pressed to squeeze out the the liquid, salted and laid out on wooden racks to dry in the sun for 10 or 15 days (Figures 11 and 12). During the drying process the fillets are turned from time to time and at night they are stored away (Figure 14). The dry fillets are packed in cartons containing 25 pounds each. No cellophane paper or any other packaging material is used because the meat, according to the packers, keeps better without it.

The yield of fresh meat reportedly is about 40 percent of the live weight of the shark. Once cured and dried, the fillets shrink to about 45 percent of the weight of the fresh meat or to about 35 pounds for a shark that weighed alive about 200 pounds.

Livers intended for export usually are cut into small pieces immediately upon arrival at the packing plant (Figure 15). The pieces are placed in new drums containing 4 to 10 percent brine solution, usually bisulphate. Livers weigh about 10 percent of the total weight of the male and 12 or 13 percent of the weight of female sharks, or an average respectively of 15 and 20 pounds. The drums usually contain about 435 to 450 pounds net of chopped liver.

In Cuba there are at present only two shark-oil rendering plants, one in the City of Habana and another at Cojimar. Equipment for a third one reportedly has been ordered from the United States and soon will be installed.

At one plant the livers are emptied from the original brine barrels and put through a grinder. About two parts of water are added and the mixture is poured into a digestor which is heated for about two hours at 180° Fahrenheit.

At times when emulsions occur, caustic soda is added to aid in tearing the tissues apart and releasing the oil. The resulting fluid is transferred to another tank from which it is fed by gravity into a separator with two bowls. A first separation renders the oil free from the gurry and most of the water. The second separation removes the remaining water, blood and other residues. The sediment, which contains a large amount of proteins, is not processed because the output is still too small to warrant installation of the necessary evaporating equipment. Stearine in the oil, however, is filtered through a pressure filter with twelve cloths.

The other plant renders the oil in about the same manner, except that the livers are ground two or three times and the mixture is put through a centrifuge and then clarified in a separator.

While the owner of one plant declared he obtains 60 or 70 pounds of crude oil from every hundred pounds of liver, another indicated he obtains only 50 or 60 pounds. The crude oil is packed in 55-gallon steel drums containing 400, 410 or 420 pounds net. The specific weight of one gallon of the crude oil is about 7.7 pounds.

Some shark oil--about 2,500 pounds yearly--is refined in Cuba by one of the two rendering plants. The crude oil is saponified, sometimes with caustic soda, to remove the fatty acids, and the unsaponified portion containing the vitamins is sold to local laboratories. The production of refined oil is not being increased because, (1) the demand in Cuba is small, (2) the cost of production is very high, (3) the loss of vitamins in refining is high, reportedly ranging from 10 to 20 percent, and (4) the difference in the United States price between crude and refined oil is so small that it does not warrant the effort of refining.

The vitamin content per gram of shark liver oil of course varies with the kinds of sharks. The contents of the principal species in Cuba, according to the rendering plants, are as follows:

Kind of shark	Units of Vitamin A per gram of oil (units)
Night shark (de noche)	
Male	12,000 to 16,000
Female	10,000
Man-Eating (Jaqueton)	7,000 to 9,000
Black-tipped (Galano)	16,000
Hammerhead (Cornuda), Male	20,000
Cow or six-gilled (Cana-bota)	20,000
Surgeon (De ley)	18,000 to 20,000
Jakie (Cabeza de batea)	8,000 to 9,000
Tiger or Leopard (alecrin)	6,000

Occasionally the vitamin content of male sharks reportedly decreases sharply to as little as 1,200 units. The vitamin content of the male Cow or six-gilled shark (cana-bota) is high in December and January but drops greatly during the rest of the year.

Marketing Methods: Shark fins are sold direct by the fishermen or the fishing companies either for consumption by the Chinese in Cuba or for export. Cuban processors of fins for export complain that when the export market is dull, the fins, particularly from night sharks, are graded as seconds.

Shark skins are collected through stations at out-ports or by the terminal plants themselves. There is now considerable competition for the acquisition of the shark skins between the Jaimanitas shark skin tannery and the exporting firms. Exports of shark skins are usually on a consignment basis. The broker or importer in the United States usually makes settlement after grading the skins by established standards such as size, sour spots, holes, etc.

Tanned hides are all exported to the United States. The tannery receives payment by the square foot. Demand for these hides is much greater than the output.

Shark meat is marketed in 25-pound cartons under several trade names but there is no indication that the content is a shark product. Most of the production is sold locally to large produce wholesalers who in turn dispose of it to general stores in the interior or direct to sugar mills for consumption by workers at the plantations. Practically the entire meat production is consumed within Cuba.

Shark livers are marketed in various ways. Fishermen may sell the whole shark or only the livers to collecting stations, to processors for repacking for export or to the oil rendering plants. Processors may sell to the rendering plants or export directly to the United States on a consignment basis. The rendering plants may convert the livers into oil or export them in brine. The livers are usually exported in new drums with 435 or 450 pounds net weight. The drums often lie in storage for a number of days awaiting transportation, and although this reportedly does not affect the vitamin content, it does increase the fatty acids.

Two Cuban exporters of shark livers have complained that the method of making settlement is arbitrary and unsatisfactory. Apparently fixed rates are used in determining content: From every 100 pounds net of liver, 10 pounds are deducted for salt whether there is that much salt or not. Oil content is figured at 60 percent of the remaining 90 pounds, even if the actual analysis reveals that it is larger. The exporters feel that the fault lies with the brokers, and, consequently, they seek to deal directly with the ultimate users.

Crude shark oil is sold by the two rendering plants directly to users in the United States or through brokers. Three samples are taken from blended lots. One is sent to the prospective buyer, another to a food research laboratory in the United States, and a third one is kept by the exporter. Settlement is made by the buyer on the basis of vitamin content. Refined oil is disposed of directly to local laboratories.

A little stearine produced from shark oil residues is sold to local tanneries.

CUBAN FIRMS DEALING IN SHARK PRODUCTS

Compania Nacional de Vitamines, S.A., San Carlos 816, Habana (Processing plant and oil rendering plant at Cojimar): Shark meat, fins, livers in brine, crude and refined oil. No skins.

Compania de Pesca del Valle, S. A. (Thorvald Sanchez), Calle Concha No. 54, Habana (processing plant at Cojimar, oil rendering plant at Concha 54, Habana.) Shark meat, fins, livers in brine, salted skins, crude and refined oil.

Compania Industrial de Pesca, S. A. (formerly Blanco y Villa-nueva) Real 205, Cojimar, Cuba (soon will install oil rendering plant): Shark meat, fins, salted skins, livers in brine.

West Indies Fish Products Company, Calle Cuba 225, Habana (Shark skin tannery at Jaimanitas, Marianao): Shark hides and bellies.

Garcia, Ordonez y Enriquez, Edificio Bacardi, Habana (Export agents for minor producers.) Meat, fins, salted skins, livers in brine.

Frima Products Company, Compostela 927, Habana (Export agents): Meat, fins, salted skins, livers in brine.

Jose Martorell y Compania, Isabela de Sagua, Las Villas Province: Salted skins, livers in brine, fins, meat.

S. Mestres del Rio, Acosta 358, Habana (Producer and exporter of shark products).

R. Alvarez R., Calle 6 No. 558, altos, Vedado, Habana (Dealer in shark products).

A. B. Kelm, Isle of Pines Chamber of Commerce, Nueva Gerona, Isle of Pines (Export agent for minor producers).

Details as to the nature of the operation of the following firms are not known:

Shark Products Company, Boca de Jaruco, Habana Province
Manuel R. Pintado, Sagua de Tanamo, Oriente
A. Oliva, Caibarien, Las Villas
Fernando G. Tarafa, Paseo de Marti 104, Habana
Bautista Bou, La Gloria, Camaguey.

Employment: An estimated 400 people are employed regularly in the shark fishing industry, as follows:

	Number of People
Fishermen	200
Personnel at processing stations	80
Personnel at collecting stations	30
Personnel at processing plants in Cojimar	20
Personnel at two oil rendering plants	6
Personnel at tannery in Jaimanitas	5
People indirectly employed	60
	401

At the processing stations there usually is one man in charge and one, two or three helpers. At the collecting stations there is one individual who does most of the work and who hires someone by the hour whenever necessary. The three large processing plants at Cojimar each have one fish technician, in addition to the laborers who skin, flesh, etc., The two rendering plants each have a chemist.

The earnings of a skipper on a schooner amount to $60 monthly, plus a bonus of 2 or 3 cents per gross pound of sharks caught and a small percentage of the oil content. A boatswain earns $90 monthly with no other emoluments. Fishermen earn $100 to $400 per annum from shark fishing, $300 being the average. This average is based on the assumption that the average yearly catch of two fishermen is about 15,000 pounds, which at a price of 6.5 cents per pound brings $975. From this the fishermen defray about $360 yearly for bait, upkeep, etc., leaving a net income of about $600 which is divided between the two. The fishermen, of course, receive additional income from catches of other sea foods.

Some of the men in charge at processing and collecting stations earn $60 while others earn $80 or $90 monthly. All receive a bonus of 50 or 60 cents for each shark handled, which includes skinning, fleshing, dressing, drying, packing, etc. Part of this bonus is used to pay outside help by the hour or piece whenever work becomes heavy. Employees at these stations usually receive $60 monthly.

The men at the rendering plants earn $75 to $90 per month.

Consumption: Only the dried shark meat, a little refined shark liver oil and part of the shark fins are consumed in Cuba. Practically all of the meat is consumed in rural areas. The consumption in 1946 is estimated at about half a million pounds or slightly more than the 1945 consumption and five times the average consumption in 1937-41. Consumption was largest, however, during the war years. Small quantities of shark fins are consumed by the Chinese in Cuba; consumption was greatest during the war years when shipping was scarce and exports difficult. About 3,000 pounds of refined shark liver oil is consumed annually in Cuba. The entire production of all other shark products is exported.

Exports: The value of exported shark products increased substantially from an average of about $17,000 in 1937-41 to $133,000 in 1946. In terms of weight, 1946 exports were twice the 1937-41 average. Of the shark products exported in 1946, livers in brine were the most important, accounting for 63 percent of the total weight of these exports and 54 percent of the total value. Exports of liver oil have declined sharply from about 62,000 kilos in 1944 to only 13,452 kilos (value $23,117) in 1946. Exports of salted skins in 1946 also decreased and amounted to only 21,455 kilos (value $9,082) or less than half the 1945 volume. This decline, however, was more than offset by the large exports of tanned shark hides in 1946 (made for the first time) amounting to about 6,000 hides and worth about $12,000. Exports of fins totalled 8,860 kilos or about the same as in 1945, but were valued at $16,967 or 70 percent more than in 1945. No shark meat was exported in 1946.

Practically all exports of shark products have been to the United States with the exception of an average of 8,000 kilos (value $2,000) of salted shark skins exported to Germany and Holland in 1937-41, and 4,000 kilos of shark livers in brine (value $20,000) shipped to Czechoslovakia in 1946.

Table 3 - Cuban Exports of Shark Products, by Items, Average 1937-41, Annual 1942-46, Inclusive

Year	Skins Salted	Livers in Brine	Liver Oil	Fins	Total 1/ All Products
	QUANTITY				
	1,000 kilos	1,000 kilos	1,000 kilos	1,000 kilos	1,000 kilos
Average 1937-41	39	17	2/	7	63
Annual					
1942	40	53	2/	4	97
1943	43	86	21	4	155
1944	45	80	62	7	195
1945	46	69	36	8	159
1946	44 3/	84	13	9	150
	VALUE				
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars
Average 1937-41	11	3	0	3	17
Annual					
1942	13	21	0	3	37
1943	14	38	13	3	68
1944	11	33	38	5	87
1945	14	29	45	10	98
1946	21 3/	72	23	17	133

1/ Includes small quantities of salted shark meat.
2/ Some exported but probably included under "Other Animal Oils and Fats."
3/ Includes 6,000 tanned hides, valued at $12,000.
Note: Foreign trade statistics, Cuban Ministry of Finance, except tanned hides, number and value of which was obtained from West Indies Fish Products Company.

Local tanning factories have a priority over exports of skins. The Cuban Department of Commerce posts notices when shipments are ready to leave Cuba, giving local tanners the right to purchase any skins intended for export. Exports of shark skins therefore will possibly decline further while exports of tanned hides will increase proportionately.

Imports: Foreign trade statistics do not show any imports of shark products. Imports of small quantities of by-products possibly are included globally under some unclassified item.

Prices: Methods of pricing sharks and shark products have changed with the growth of the industry and with changing conditions. Prices have also varied in different areas, but have advanced sharply.

Cuban Exports of Shark Products, by Countries of Destination, Average 1937-41, Annual 1942-1946, Inclusive

Country and commodity	Average 1937-41	1942	1943	1944	1945	1946
	QUANTITY					
	1,000 kilos	1,000 kilos	1,000 kilos	1,000 kilos	1,000 kilos	1,000 kilos
United States						
Shark skins, salted	31	40	44	45	46	21
Shark fins	7	5	4	7	8	9
Shark livers in brine	17	53	86	80	69	80
Shark liver oil	1/	1/	21	62	36	13
Shark meat	0	0	4/	1	0	4/
Others						
Shark skins 2/	8	0	0	0	0	4/
Shark fins 3/	4/	0	0	0	0	4/
Shark livers	0	0	0	0	0	4/ 5/
	VALUE					
	1,000 dols.	1,000 dols.	1,000 dols.	1,000 dols.	1,000 dols.	1,000 dols.
United States						
Shark skins, salted	8	13	14	11	14	9
Shark fins	3	3	3	5	10	17
Shark livers in brine	3	21	38	33	29	52
Shark liver oil	1/	1/	13	38	45	23
Shark meat	0	0	4/	4/	0	4/
Total	14	37	68	87	98	101
Others						
Shark skins 2/	2	0	0	0	0	4/
Shark fins 3/	4/	0	0	0	0	4/
Shark livers	0	0	0	0	0	20 5/
Total	3	0	0	0	0	20
Total value all shark exports	17	37	68	87	98	121

1/ Probably some exported, but included under "Other Animal Oils and Fats".
2/ Germany and Holland.
3/ China.
4/ Less than 500.
5/ Czechoslovakia.
Note: Foreign trade statistics, Cuban Ministry of Finance.

Until the end of 1937, prices to fishermen for whole sharks were figured on a measurement basis and were from $0.50 to $3.00 per shark depending on the size which ranged from 35 to 105 inches. Since early 1938 the price for sharks has been figured on a weight basis; in 1938 fishermen received 1 or 2 cents per gross pound, and the lower price prevailing at outports and the higher price at Cojimar where the principal processing plants are located; the price rose gradually to around 1.5 and 3 cents in 1940, 2 and 4 cents in 1941, 2.5 and 5 cents from 1942 to 1945, 3 and 6 cents in 1946, and at present ranges from 4 to 7.5 cents. The price increase to 6.5 and 7.5 cents at Cojimar has forced one of the large operators to discontinue buying there and to operate only at outports.

On the basis of weight of about 150 pounds for a male and 200 pounds for a female shark, the price at present is about $6.00 for males and $8.00 for females at outports and $11.25 to $15.00 at Cojimar. This is about 12 times the minimum and 5 times the maximum prices paid in 1937, and reportedly is very much higher than that paid for whole sharks in Florida.

The price of shark skins has also increased sharply. Competition is keen between United States importers and the local tannery at Jaimanitas. The tannery is offering $0.70 for skins 35 to 49 inches long and $5.40 for skins 126 to 135 inches long, delivered at tannery (Table 4). Importers in the United States reportedly twice have increased their c.i.f. New York offers above those paid by the tannery, once by 20 percent and again by an additional 20 percent, bringing their prices to 44 percent above the tannery's prices. Prices in 1935 were from about 13 to 23 percent below those now being paid by the tannery and 40 to 49 percent below those being offered by importers in the United States.

The tannery is selling the tanned hides at 53 cents per square foot c.i.f. New York, but claims that this is not a profitable price. It intends shortly to increase the price to 75 cents per square foot c.i.f. New York.

The price of fins varies considerably. Unclassified lots are sold c.i.f. New York or f.o.b. Habana at prices ranging from $0.75 to $1.45 per pound. Offers at present from importers in the United States reportedly are $1.45 for No. 1 (large) and $1.00 for No. 2 (Medium) per pound c.i.f. New York. These prices compare to $1.20 per pound for firsts and $0.75 for seconds in 1946, and as low as $0.08 to $0.40 per pound in 1940.

The price for shark liver in 1941 was around 8 cents c.i.f. New York per million U.S.P. units of vitamin A. It rose to about 9 cents in 1943 and 10 cents in 1944. In 1945 the price ranged from 10 to 14 cents, at which level it remained as long as the Office of Price Administration ceilings were enforced. Upon removal of the United States price ceilings in October 1946, prices rose progressively to about 25 cents c.i.f. New York. At present the price fluctuates between 20 and 28 cents.

The price for crude oil during the war was 14.5 cents per million U.S.P. units, c.i.f. New York. This brought returns to the rendering plants of from 10 to 12 cents after deducting freight, insurance and commissions. After the ceilings were removed in October 1946 the prices fluctuated considerably and in March 1946 reached a peak of 28 cents. At present the price is around 23 cents c.i.f. New York.

Processors obtain higher prices in Cuba for shark meat than they have succeeded in obtaining from foreign markets. Before 1941 the dried shark meat was sold in Cuba for as little as 3 cents per pound. During the war, however, when there was a scarcity of foodstuffs in general, shark meat was sold wholesale for 28 or 30 cents per pound and retailed for as much as 40 or 50 cents. At present the wholesale price ranges from 15 to 22 cents. When fresh beef, dried codfish or jerked beef are plentiful the price usually drops temporarily to 10 cents.

Table 4 - Prices for Cuban Salted Shark Skins, 1935 f.o.b. Habana, 1947, at Jaimanitas and c.i.f. New York

Length of skin	1935	April 1947	
	F.o.b. Habana[1]	At Jaimanitas[2]	C.i.f. New York[3]
inches	dollars per skin		
33 to 49	0.25	-	-
35 to 49	-	0.70	1.01
50 to 59	0.70	0.90	1.30
60 to 64	0.90	1.15	1.66
65 to 69	1.20	1.50	2.16
70 to 74	1.50	-	-
70 to 80	-	2.00	2.88
75 to 79	2.00	-	-
80 to 90	2.50	-	-
81 to 90	-	2.50	3.60
91 to 94	-	2.90	4.18
91 to 100	2.90	-	-
95 to 104	-	3.35	4.82
101 to 110	3.35	-	-
105 to 115	-	3.90	5.62
111 to 120	3.50	-	-
116 to 125	-	4.55	6.55
121 to 130	4.00	-	-
126 to 135	-	5.40	7.78

1/ From Report No. 241, August 7, 1935, "Industrial and Commercial Utilization of the Shark."

2/ From list of price offerings issued by the Cuban tannery at Jaimanitas.

3/ Calculated by adding 20 percent "premium" plus an additional 20 percent bonus to schedule of prices shown on page 49 of Guide to Commercial Shark Fishing in the Caribbean Area, Fishery Leaflet 135, Fish and Wildlife Service, Washington 1945.

Outlook: The Cuban catch of sharks may continue to increase, providing fishing methods are modernized. More intelligent shark fishing would result from better knowledge of the migratory habits and the spawning season of sharks. Cubans are awakening to the potentialities of this industry and are trying to utilize more fully the various products. Henceforth Cuba's exports of tanned shark hides probably will be greater than those of the salted skins. Increased demand for shark skins from the United States probably will encourage greater production of this item, which, however, is dependent upon the size of the catch. With the installation of a third oil rendering plant in Cuba, export of shark liver oil may increase while exports of livers in brine decrease. When Norwegian codfish again becomes plentiful, Cuban consumption and, consequently, production of shark meat will probably decline.

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CUBAN GOVERNMENT FOSTERS FISHING COOPERATIVES[1]

The Cuban Government has embarked on a plan to create fifteen fishermen's cooperatives and to invest about $500,000 in canneries and ice plants, of which the first were inaugurated at Batabano on May 9, 1947. The objective avowedly is to improve the income of fishermen, stimulate production, and reduce prices to consumers. Some private fishing companies, however, have expressed concern that the cooperatives may force private companies out of business.

In 1946, the Cuban Government announced a plan for agricultural development,[2] for which it appropriated three million dollars. Included in the plan was a proposal for the creation of fishing cooperatives.

On May 9, 1947, President Ramon GRAU officially turned over to the "Cooperative of Seamen, Fishermen and Workers of the Fishing and Related Industries"[3], at Batabano in Habana Province, a brick building measuring 454 square meters. This building houses a complete cannery including one rotary horizontal autoclave, two vertical autoclaves, one exhauster, an automatic sealing machine, a labeling machine, several conveyors and other equipment. The capacity of the cannery reportedly is 20,000 tins of 5.5 ounces each of bonito, sardines or lobster per eight-hour day. The building also houses an ice plant producing 5.5 tons of ice daily; a dryer and a grinding mill for making at least two tons of fish meal daily; a laboratory; and radio transmitting and receiving sets with a range of over 600 miles. The cost of the building and all of the equipment was around $100,000[4] which has been charged to the Cooperative as a loan payable in twenty years.

President Grau also is to turn over to the Cooperative two fishing boats now being built. One is a 56-foot, 110 h.p., gasoline-propelled schooner for fishing bonito, and the other is a 38-foot, 50 h.p., schooner for catching lobster.

The creation of the Cooperative at Batabano and the distribution of fishery paraphernalia is only the beginning of the Cuban Government's program for stimulating seafood production as one of the means of coping with the prevalent food shortage. Another $100,000[5] is to be invested by the Government in erecting a cannery, an ice plant and a fish-meal factory for the fishermen's cooperative at Cienfuegos on a plot of 8,500 square meters donated by a private individual, and in four boats: two 50-foot sail-propelled schooners, a 25-foot and a 30-foot motor-driven boat, and two tons of fishing gear, including lines, hooks, etc.

1/ Report No. 220, by Joseph L. Martinez, Clerk-Translator, American Embassy, Habana, Cuba, (June 9, 1947).

2/ See Reports No. 390, October 14, 1946, "Cuban Government Authorizes Three Million Dollars for Agricultural Improvement", and No. 178, May 8, 1946, "Cuban Cabinet Recommends Plan for Increased Agricultural Production."

3/ "Cooperativa de Marineros, Pescadores y Trabajadores de las Industrias Derivadas de la Pesca."

4/ Appropriated per Decrees No. 3260 of September 15, 1945 ($80,000), and No. 679 of March 28, 1946 ($19,000).

5/ Funds allocated per Minister of Agriculture's Resolution No. 314, dated February 28, 1947, from the three million dollars authorized for agricultural development in Presidential Decree No. 2649, Official Gazette of Oct. 22,1946.

About $20,000 each is to be invested in Habana, Cardenas, Santa Cruz del Sur, Caibarien, Matanzas and Casilda, and $10,000 each in La Coloma, Baracoa, and Manzanillo, Gibara, Nuevitas, Mariel and Puerto Esperanza[1], for fishing schooners and 18-foot row-boats, fishing gear, fish-salting and fish-smoking equipment, as well as for repairs of small, delapidated wharves. An ice plant producing three tons daily is also to be erected at Santa Cruz del Sur.

These disbursements, totaling about $500,000, are in addition to others made by the present Administration for the benefit of the Cuban fishing industry. Some 25 fishing vessels damaged by the hurricane of 1944 were repaired at a cost of some $300,000 to the Government and were returned to the owners in July 1946. About twenty lobster fishing row-boats at La Coloma were built in October 1946 from another appropriation. A sturdy wharf 300 meters long was built at Batabano, at a cost of about $70,000, and inaugurated only a short time ago.

The Fishermen's Cooperative at Batabano is to be governed by statutes prepared by the Cuban Ministry of Agriculture. Briefly, they provide that fishermen and workers in allied industries in Batabano and the Isle of Pines are eligible for membership. This includes those who catch fish, sponges, lobsters, crabs and turtles, as well as the crews of boats and workers on shore. Members must subscribe to at least one share each of the Cooperative's stock. The Cooperative is to be administered by a Council of nine permanent and six substitute members to be elected for two years from among its members; and a mixed committee of four technicians designated by the Minister of Agriculture. The Council is to choose its President, Vice-President, Secretary and Treasurer from among its members.

The Cooperative's assets are to be derived from (1) the amount invested by the Government in buildings, equipment and boats, (2) the amount of shares subscribed to by members of the Cooperative, (3) the amount of profits from fishing boats, the ice plant, the cannery and from the fish-meal plant, (4) commissions from consumer goods, (5) interest from loans to members, and (6) profits from any other enterprise the Cooperative may undertake, such as weaving nets, etc.

The Cooperative is to acquire at wholesale everything fishermen use, including fishing gear, foodstuffs for consumption while fishing, ice, etc. Prices to members are not to exceed 15 percent above cost.

The Cooperative is to sell its production through the least number of intermediaries. Net profits are to be distributed as follows: (1) twenty percent for the Cooperative's reserves; (2) twenty percent for improvements in buildings and equipment; and (3) sixty percent for distribution among members in proportion to the contribution of each in volume of purchases and sales through the Cooperative.

It is planned to emit $25,000 in shares of $25 each, amortizable in twenty years. The proceeds are to be used for further improvements in the plant, for buying materials such as tins, labels, advertising, etc.

1/ For relative importance of these ports, see Report No. 372, September 20, 1946, "The Cuban Fishing Industry."

Fishing companies have expressed different views about the effect of the Government's program on private interests. One large canner of lobster and tuna stated that he cannot possibly compete with these cooperatives and that, consequently, he has offered his plant for sale to the Government. Another stated that the cooperative at Batabano merely constitutes another competitor. Still another stated that the cooperative will fail because "there are too many cooks working on one pie." The Government feels certain, however, that its cooperatives will succeed through reducing the price of fish products.

FIG. 1 - COJIMAR, THE PRODUCTION CENTER.

FIG. 2 - THE NIGHT SHARK IS THE MOST IMPORTANT SPECIES.

FIG. 3 - MOST SHARKS ARE CAUGHT IN ROW-BOATS.

FIG. 4 - TYPE OF FISHING GEAR USED ON SCHOONERS.

FIG. 5 - A BAD DAY'S CATCH OF ONE ROW-BOAT.

FIG. 6 - SHARKS ARE SKINNED AT THE BEACH.

FIG. 7 - FLESHING A SKIN ON THE BEAMING BOARD.

FIG. 8 - SHARK SKIN, FLESHED.

FIG. 9 - CARRYING 200 POUNDS OF PRODUCTS TO THE PLANT.

FIG. 10 - SHARK FINS DRYING IN THE SUN.

FIG. 11 - LONG BAG CONTAINS DRIED SHARK FINS AND WIDE BAG CONTAINS SKINS.

FIG. 12 - SHARK FILLETS DRYING IN THE SUN.

FIG. 13 - SHARK MEAT DRYING IN THE SUN.

FIG. 14 - AT NIGHT THE DRYING RACKS WITH THE MEAT ARE STORED AWAY IN A BUILDING.

FIG. 15 - THE LIVER OF A FEMALE SHARK WEIGHS ABOUT 20 POUNDS.